Production Order Integration between ERP and All Using Generic Document Interface: Process Test Case

Applies to
All 5.1

Summary
This scenario outlines the integration of production orders in SAP ERP with the SAP Auto-ID Infrastructure (SAP AII). It explains how the various application components fit together and interact to create a closed loop integration. It covers the configuration of ERP, XI and AII and walks you through the execution.

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Company: SAP
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1. Acknowledgements

This integration test would not have been possible without input from several individuals from Auto ID Development, Quality Assurance and Solution Management organizations.
2. Purpose

This scenario test case outlines the integration of production orders in SAP ERP with the SAP Auto-ID Infrastructure (SAP AII). The following swim lane diagram explains how the various application components fit together and interact to create a closed loop integration.

The whole closed loop integration is not delivered as part of the standard software delivery from SAP. This test shows how you could set up the production order integration using SAP AII 5.1.
3. Summary of the Steps

The following section summarizes the necessary steps in each application component:

3.1 ERP:
1. It is essential that the testing team has an expert in PP area in ERP.
2. Create master data and carry out the necessary configuration to create a simple production order for one final product with one or more production steps.
3. Carry out the necessary configuration to enable the Plant Data Collection (PDC) interface so that when the production order is created (or released), the order information is sent via this PDC interface to XI and then finally to SAP AII. Click here to see a document that provides details about the PDC interface.

3.2 XI:
1. It is essential that the testing team has an expert in XI area.
2. Import the PDC IDoc into XI (if not already available).
3. Map the outgoing PDC IDoc from ERP to the generic document interface on the SAP AII side (see “Further Hints” for interface details) in the Integration Repository in the Integration Builder.
   ii. Details of the mapping will be added as it is finalized during the course of this test case.
4. Carry out the message mappings as well.
5. Ensure that the business and technical systems are configured in the System Landscape Directory (SLD).
6. Carry out the necessary configuration (scenario, receiver determination, and so on) to finish the XI configuration.

3.3 Auto ID Infrastructure:
1. Perform necessary customizing in SAP AII to store the fields at document header and line item level that the mapping provides.
2. Create the product with the unit of measure (UOM) and corresponding new GTIN. The product name and UOM must be exactly the same as defined in SAP ERP.
3. Copy the rule LOAD_AA to your own Z_PROD_AA rule. Remove unwanted activities.
4. Create a new activity that makes an RFC call back to SAP ERP to post the confirmation for the entire production order after all the EPCs are read. The BAPI is BAPI_GOODSMVT_CREATE. This activity essentially looks at the document status and, if it is set to complete, calls the RFC and set the document status in SAP AII to ‘Sent’. In a rule, this activity comes after the document matching activity BTD_POBJ_ASSIGN that matches the actual objects with the document expected quantity.
4. Details of Steps

4.1 Configure ERP

4.1.1 Navigation

- Logistics Execution
- Quantity Management
- Plant Maintenance and Customer Service
- Customer Service
- Production
  - Basic Data
  - Sales & Operations Planning (SOP)
  - Distribution Resource Planning (DRP)
  - Production Planning
  - Capacity Requirements Planning
  - Material Requirements Planning
  - Shop Floor Control
- Master Data
  - Order
    - Define Order Types
    - Define order type-dependent parameters
    - Define status profile
    - Define selection profiles
    - Define number ranges for orders
    - Define number ranges for confirmations
    - Define number ranges for reservations
    - Define number ranges for operations
    - Define number ranges for capacity requirements
  - Routing Data
  - Bill of Material
  - Production Resources/Tools
  - Trigger Point
    - Define production scheduling profile
    - Define production scheduler
    - Define matchcode
4.1.2 Step Description

**Settings for Production Order Type:** In this step you create a new production order type or use an existing production order type. Make the following setting for production order type dependent parameters:

1. In Customizing, choose *Production → Shop Floor Control → Master Data → Order → Define order-type dependent parameters.*
2. On the *Implementation* tab page, select the *PDC Active* indicator in the *PDC* section.

**Change View "Order Type-Dependent Parameters: Overview": Details**

<table>
<thead>
<tr>
<th>Plant</th>
<th>Order Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>0001</td>
<td>Z631</td>
</tr>
</tbody>
</table>

**Status change documents:**
- [x] For Order Header
- [x] For Operation
- [ ] For Material
- [ ] For Production Resource Tool

**Shop floor information system:**
- [x] Update
  - Release versions:
    - [x] Header
    - [x] Item
    - [ ] Operation

**Documentation of goods movements:**
- [x] GR for Purchase Order
- [x] GR for Production Order
- [x] Planned Goods Issue
- [x] Unplanned Goods Issue

**PDC:**
- [x] PDC Active
**Setting for Work Center:** Make the following setting for work centers of operations that are to be transferred to SAP AII for confirmation.

1. On the SAP Easy Access screen, choose **Logistics → Production → Master Data → Work Centers → Work Center → Change**.
2. On the **Basic Data** tab page, choose **Subsystems** under the **Standard Values Overview** table. Specify the subsystem group.
4.2 Design XI

4.2.1 Import the IDoc Message Type OPERA2

Import the IDoc OPERA2 into your software component and namespace, for example:

You can see the imported IDoc as follows:

<table>
<thead>
<tr>
<th>Name</th>
<th>OPERA2.OPERA2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Namespace</td>
<td>urn:sap-com:document:sap:idoctypes</td>
</tr>
<tr>
<td>Software Component Version</td>
<td>XITESTCOMPONENT 7.0</td>
</tr>
<tr>
<td>Description</td>
<td>Operations in KK2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Structure</th>
<th>XSD</th>
<th>WSDL</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPERA2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDOC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BRF6IN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EDI_DC10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F1OPER2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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4.2.2 Map Interface OPERA2 to BusinessDocumentExecutionRequest

Map the appropriate fields from the IDoc to the BusinessDocumentExecutionRequest interface in the namespace http://sap.com/xi/AIN.

Interface mapping:
4.2.3 Map Message OPERA2 to BusinessDocumentExecutionRequest

XITESTCOMPONENT

Integration Scenarios & Integration Processes

Interface Objects

- Message Interfaces
- Message Types
- Fault Message Types
- Data Types
- Data Type Enhancements
- Context Objects
- External Definitions

Mapping Objects

- Interface Mappings
- Message Mappings

- AirlineInfo_SXIDEMO_AIRL_FLIGHT_CHECKAVAIL
- AirlineInfo_SXIDEMO_AIRL_FLIGHT_CHECKAVAIL_Resp
- FlightSeatAvailabilityRequest_Query_XUA
- FSACheck_Agency2AirlineRFC_Req
- FSACheck_Agency2AirlineRFC_Resp
- GD_Document_map
- HandlingUnitCreate_HU_CREATE
- HandlingUnitDelete_HU_DELETE
- HandlingUnitPack_HU_PACK
- HandlingUnitUnpack_HU_UNPACK
- OPERA2_BusinessDocumentExecutionRequest
- PPRCORDER_BusinessDocumentExecutionRequest
- PPRCORDER_BusinessDocumentExecutionRequest

Mapping Templates

- Imported Archive
Activate your change list and release.

### 4.3 Configure XI

Once the mappings have arrived in the test system, perform the necessary configuration.

Make sure that the required systems are defined as technical and business systems in the administration (see the XI set up guide).

#### 4.3.1 Define the Receiver Agreement

- **Party**
  - Service Without Party
  - Receiver Determination
  - Interface Determination
  - Sender Agreement
- **Receiver Agreement**
The receiver agreement should look as follows:

4.3.2 Define the Interface Determination
The interface determination should look as follows:

4.3.3 Define the Receiver Determination

AutoID_Test
   ▼  Party
   ▼  Service Without Party
   ▼  Receiver Determination
       ▼  OPERA2.OPERAO2
           [*] PPCC2RECORD,PPCC2RECORD
           Q3A_002, SXIDEMO_AIRL_FLIGHT,
           R4Q_001, FlightSeatAvailabilityQuery,
           R4Q_001, FlightSeatAvailabilityQuery,
           R4Q_001, HandlingUnitCreateRequest,
           R4Q_001, HandlingUnitDeleteRequest
           R4Q_001, HandlingUnitDeleteRequest
           R4Q_001, SXIDEMO_AIRL_FLIGHT,
           R6Q_001, HandlingUnitCreateMessage,
           R6Q_001, HandlingUnitDeleteMessage,
           R6Q_001, HandlingUnitUnpackMessage
           R4Q_Agency, AirlineQuery_BPM, Flight
The receiver determination should look as follows:

![Image of Receiver Determination](image)

- **Sender**
  - Party
  - Service
  - Namespace: `UNH/120/channel/messaging`

- **Receiver**
  - Party
  - Service
  - Description

- **Type of Receiver Determination**
  - Standard
  - Extended

- **Configured Receivers**

<table>
<thead>
<tr>
<th>Condition</th>
<th>Party</th>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>FND_601</td>
</tr>
</tbody>
</table>

- If no Receiver is found, proceed as follows:
  - Terminate Message Processing with Error (Restart Possible)
  - End Message Processing Without Error (Restart not Possible)

- Configuration Overview for Receiver Determination:

<table>
<thead>
<tr>
<th>Receiver (Partner</th>
<th>Service)</th>
<th>Interface Mapping</th>
<th>Receiver Agreement (Communication Channel)</th>
</tr>
</thead>
</table>
4.4 Create Production Order

4.4.1 Navigation

<table>
<thead>
<tr>
<th>Menu path</th>
<th>SAP Menu → Logistics → Production → Shop Floor Control → Order → Create → With Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction code</td>
<td>CO01</td>
</tr>
</tbody>
</table>

4.4.2 Step Description

Create a production order of production order type, created in step 1, for some output quantity of the material and create operations for this production order. Specify the work centers, created in step 2, for the operations.

1. On the SAP Easy Access screen, choose Logistics → Production → Shop Floor Control → Order → Create → With material.
2. Create a production order. Create operations for this production order.
3. Release the production order. The production order should not have the status Technically Complete. The production order must neither be locked nor flagged for deletion.

4.4.3 Checks – Expected Behavior

Ensure that the production order was creates (and released if necessary) and that the PDC IDoc was sent out with the relevant information for the XI mapping and SAP AII.

If the IDoc could not be sent out, check transaction WE05 to resolve the error.

Make a note of your production order number.
4.5 Send Production Order to XI

There are two approaches to sending the production order to the XI system. We recommend the second approach (using the OPERA2 interface), as it sends incremental data.

4.5.1 Transfer Initial Production Order Data from ERP to XI Using the PPC Interface

This approach is less useful.

Execute transaction CI42N (program CIBDOP_DOWN_PP). Specify the logical system to which production order data is to be transferred.

The transaction CI42N always transfers data from all the production orders.

4.5.1.1 Checks – Expected Behavior

Check in transaction WE19 whether the logical message PPCC2REORDER was created and sent to XI system successfully.
4.5.2 Transfer of Production Order Data from ERP to XI Using OPERA2 Interface

We recommend that you use this approach.

Go to transaction CI44 under the following path:
One operation has been transferred:

4.5.2.1 Checks – Expected Behavior

Check the IDoc monitor (transaction WE05) to see if the procedure was successful.

4.6 Message Processing in XI

4.6.1 Navigation

Menu path

SAP Menu → ... → ... → ... → ...

Transaction code

IDX5

4.6.2 Step Description

Check message processing.

Check the message in XI in transaction IDX5.

XML Messages in Adapter
XML message in XI:

Monitor for Processed XML Messages

| Status | Executed From | Executed Until | Started | End Time | Sender ID | Receiver ID | Sender Name | Receiver Name | XML Message | ID | Warning |
|--------|---------------|----------------|---------|----------|-----------|-------------|-------------|--------------|--------------|-------------|-------|---------|
|        | 90.03.2007   | 90.03.2007     | 01.03.00 | 01.03.02 | 112        | 000006001111 | 427         | 015          | 427          | 2         |         |

```
<?xml version="1.0" encoding="UTF-8" ?>
<ns0:BusinessDocumentExecutionRequest xmlns:ns0="http://xiTest.com/xi/AIN">
  <MessageHeader>
    <ID>1</ID>
    <CreationDateTime>2007/03/06</CreationDateTime>
  </MessageHeader>
  <BusinessDocument>
    <ID>00000600111112</ID>
    <TypeCode>04</TypeCode>
    <Item>
      <ID>0010</ID>
      <Product>
        <InternalID>MG_FERTOUEL_Q1P</InternalID>
      </Product>
      <ExpectedQuantity unitCode="ST">2000</ExpectedQuantity>
    </Item>
  </BusinessDocument>
</ns0:BusinessDocumentExecutionRequest>
```

4.6.3 Checks – Expected Behavior

Check whether the IDoc was successfully received, the mapping was triggered, and the outgoing XML message was sent to SAP All.

4.7 Creation of Production Order in All

4.7.1 Navigation

<table>
<thead>
<tr>
<th>Menu path</th>
<th>/AIN/UI_COCKPIT → Document search</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction code</td>
<td>/AIN/UI_COCKPIT → Document search</td>
</tr>
</tbody>
</table>

4.7.2 Step Description

Ensure that the production order was successfully created in All.
4.7.3 Checks – Expected Behavior

The document header and item show the correct information.

If you cannot find the document, check following:

1. Check the transaction SXMB_MONI to see if the incoming XML was successfully processed, if not, then resolve the issue by looking at the error.
2. Check the transaction SLG1 to see the corresponding log entry and make sure everything was green. If there was an application error, the log should show what exactly the problem is. Fix the problem and re-start the message.

Document search UI in All:

![Document Search](image-url)
4.8 Pack cases in All

4.8.1 Navigation

<table>
<thead>
<tr>
<th>Menu path</th>
<th>/AIN/UI_COCKPIT → Document search</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction code</td>
<td>/AIN/TEST_CLIENT</td>
</tr>
</tbody>
</table>

4.8.2 Step Description

Send messages for the production order with EPCs to be stored against the order.

4.8.3 Checks – Expected Behavior

Ensure that as the EPCs are sent to All, the actual quantity is updated.

When all EPCs are scanned for the order, then ensure that the custom activity that you have previously defined makes an RFC call to ERP and confirms the production order.

Send one EPC to SAP All against this document -> Log:

- OBSERVATION message picked from queue
- Message was mapped into 1 internal message(s)
- Call rule processor with internal message number 1 for location ALM-LOC-SCAN
- Rule processing started at 08.03.2007 01:08:38
- Evaluation of condition table /AIN/CONDFRM
- Condition for rule ID Z_FRDORD_PACK_AA is true
- Processing activity CONTEXT_INIT
- Physical object with ID 'urn:epc:id:sluin00370090901014' does not exist
- Activity executed - status: OK
- Processing activity BTD_BY_DEV_DETERM
- No document had to be determined from device group
- Activity executed - status: OK
- Processing activity ACTTYPE_BY_PARAM_DETERM
- Action type Free Pack was determined
- Activity executed - status: OK
- Processing activity POBJ_CATEGORY_DETERM
- Activity executed - status: OK
- Processing activity POBJ_CREATE
- 1 new object(s) created
- Activity executed - status: OK
- Processing activity POBJ_IN_STOCK_MARK
- Activity executed - status: OK
- Processing activity POBJ_MOVE
- Activity executed - status: OK
- Processing activity POBJ_HIER_BY_PLEVEL_DETERM
- Activity executed - status: OK
- Processing activity POBJ_PACK
- Activity executed - status: OK
- Processing activity BTD_FOBI_ASSIGN
- Physical objects assigned to Production Order 000080011112, action type Free Pack
- Activity executed - status: OK
- Processing activity OBS_CREATE
- Activity executed - status: OK
- Processing activity ZPRDORD_CONF_SEND_ERP
- Cannot send document 000060011112 to backend because status not completed
- Activity executed - status: OK
- Rule processing stopped due to exit flag in rule Z_PRDORD_PACK_AA
- Processing finished at 08.03.2007 01:08:38
Document search UI:

<table>
<thead>
<tr>
<th>Document Items</th>
<th>Document Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>View Item ID</td>
<td>Action Type</td>
</tr>
<tr>
<td>Print Version</td>
<td>APL2 - Free Pack</td>
</tr>
<tr>
<td>Export UOM</td>
<td>MX_FERT0101_O1F</td>
</tr>
<tr>
<td>View Actual Document Item Objects</td>
<td>View Expected Document Item Objects</td>
</tr>
<tr>
<td>Settings</td>
<td></td>
</tr>
<tr>
<td>External Item ID</td>
<td>000010</td>
</tr>
<tr>
<td>Action Type</td>
<td>APL2 - Free Pack</td>
</tr>
<tr>
<td>Product ID</td>
<td>MO_FERT0101_GPF</td>
</tr>
<tr>
<td>Product Description</td>
<td>2</td>
</tr>
<tr>
<td>Expected Quantity</td>
<td>2</td>
</tr>
<tr>
<td>Actual Quantity</td>
<td>1</td>
</tr>
<tr>
<td>UOM</td>
<td>ST</td>
</tr>
</tbody>
</table>

Document status

<table>
<thead>
<tr>
<th>Document Items</th>
<th>Document Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action Type</td>
<td>Status</td>
</tr>
<tr>
<td>APL2 - Free Pack</td>
<td>In Process</td>
</tr>
</tbody>
</table>

Send another case to finish the document

Log:
1. Activity executed - status OK
2. Processing activity OBS_CREATE
3. Activity executed - status OK
4. Processing activity ZPRDCRD_CONS_SEND_ERP
5. Material document 5000015066 created
6. Production Order 000060011113 changed to status 'Sent' for action type APL2
7. Activity executed - status OK

Document

<table>
<thead>
<tr>
<th>Document Items</th>
<th>Document Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>View Item ID</td>
<td>Action Type</td>
</tr>
<tr>
<td>Print Version</td>
<td>APL2 - Free Pack</td>
</tr>
<tr>
<td>Export UOM</td>
<td>MX_FERT0101_O1F</td>
</tr>
<tr>
<td>View Actual Document Item Objects</td>
<td>View Expected Document Item Objects</td>
</tr>
<tr>
<td>Settings</td>
<td></td>
</tr>
<tr>
<td>External Item ID</td>
<td>000010</td>
</tr>
<tr>
<td>Action Type</td>
<td>APL2 - Free Pack</td>
</tr>
<tr>
<td>Product ID</td>
<td>MO_FERT0101_GPF</td>
</tr>
<tr>
<td>Product Description</td>
<td>2</td>
</tr>
<tr>
<td>Expected Quantity</td>
<td>2</td>
</tr>
<tr>
<td>Actual Quantity</td>
<td>2</td>
</tr>
<tr>
<td>UOM</td>
<td>ST</td>
</tr>
</tbody>
</table>

Document status

<table>
<thead>
<tr>
<th>Document Items</th>
<th>Document Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Action Type</td>
<td>Status</td>
</tr>
<tr>
<td>APL2 - Free Pack</td>
<td>Sent</td>
</tr>
</tbody>
</table>
4.9 Material Movement Posting Against Production Order in ERP

4.9.1 Navigation

<table>
<thead>
<tr>
<th>Menu path</th>
<th>/AIN/UI_COCKPIT → Document search</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction code</td>
<td>/AIN/TEST_CLIENT</td>
</tr>
</tbody>
</table>

4.9.2 Step Description

Check to ensure the material documents were correctly posted in ERP.

4.9.3 Checks – Expected Behavior

The material document is posted against the production order.

Material document posting in ERP:

![Display Material Document 5000015055: Overview](image)

Production order transaction > Goto > Document Goods Movement

![Production Order - Documented Goods Movements](image)
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